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- Villagrassa, Victor
94042 Crétell Cedex (FR)
- Bergami, Marta
94042 Crétell Cedex (FR)

(71) Applicant: Valeo Sicurezza Abitacolo S.p.A.
10026 Santena (IT)

(74) Representative: Croonenbroek, Thomas et al
Valeo Sécurité Habitacle,
42, rue Le Corbusier,
Europarc
94042 Crétell Cedex (FR)

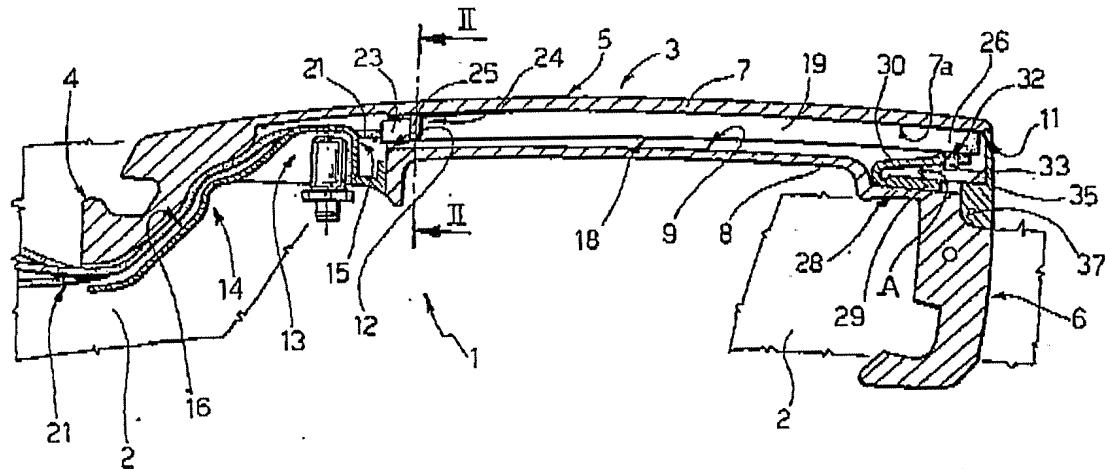
(72) Inventors:
• Meradl, Omar
94042 Crétell Cedex (FR)

(54) Vehicle door handle

(57) A handle (1) for a vehicle door has a fastening structure (2), which is connected integrally to the door; a grip member (5), which is fitted to the fastening structure (2), is gripped by a user, and defines an inner cavity

(9); a detecting device (18) housed loosely inside the cavity (9); and an elastic forcing assembly (28) for keeping the detecting device (18) in contact with a seating surface (7a) in the cavity (9).

FIG. 1



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Description

[0001] The present invention relates to a vehicle door handle.

[0002] More specifically, the present invention relates to a handle of the type comprising a fastening structure for connection to the vehicle door; a lever connected to the fastening structure and which is gripped by a user; and a sensor or detecting antenna.

[0003] In most applications, the lever has an inner cavity communicating with the outside through an opening, and into which the antenna or sensor is inserted through the opening, which is then closed by a plug.

[0004] To insert the antenna or sensor easily inside the cavity, the inside of the cavity is normally larger than the antenna or sensor, so that, during normal operation, the antenna or sensor vibrates inside the lever, thus resulting in annoying, undesired acoustic emissions and, in many cases, in rapid failure.

[0005] Besides failing to provide an effective solution to the problem, reducing the clearance between the lever and the antenna or sensor also makes it more difficult to insert and position the antenna or sensor correctly.

[0006] Moreover, being normally flexible, the lever, when gripped to open or push to close the door, flexes and transfers the external pressure to the antenna or sensor, which, as is known, is sensitive to mechanical stress. As a result, the antenna or sensor soon breaks down and must be replaced at far from negligible cost.

[0007] It is an object of the present invention to provide a vehicle door handle designed to provide a straightforward solution to the above problems, and which, in particular, provides for a high degree of efficiency and reliability at all times, while at the same time being relatively cheap.

[0008] According to the present invention, there is provided a handle for a vehicle door, the handle comprising fastening means, which are connected integrally to said door; a grip member, which is fitted to said fastening means, is gripped by a user, and defines an inner cavity; and detecting means housed loosely inside said cavity; and being characterized by also comprising elastic forcing means for keeping said detecting means in contact with a seating surface in said cavity.

[0009] In the handle defined above, said elastic forcing means conveniently act on a surface of said detecting means facing said fastening means, to push the detecting means outwards of the grip member.

[0010] A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a section, with parts removed for clarity, of a preferred embodiment of the handle according to the present invention;

Figure 2 shows a section along line II-II in Figure 1; Figure 3 shows an exploded view in perspective of

a detail of Figure 1;

Figure 4 shows a view in perspective of a variation of the Figure 3 detail.

5 [0011] Number 1 in Figure 1 indicates as a whole a handle for a vehicle door not shown.

[0012] Handle 1 comprises a fastening structure 2, which is connected integrally in known manner, not described in detail, to the door (not shown); and a lever 3 for controlling a lock (not shown) on the door.

[0013] Lever 3 comprises an end portion 4 hinged to structure 2, in known manner not described in detail, to move, with respect to structure 2, to and from an extracted position to activate the lock (not shown). Lever 3 also comprises a hollow, elongated, intermediate portion 5, which is gripped manually, in use, by a user; and an end portion 6, opposite portion 4, which extends through structure 2 and is connected to the door lock (not shown).

[0014] Intermediate portion 5 comprises a longitudinal front wall 7 facing, in use, the user and defined internally by an inner surface 7a; and a rear wall 8 facing front wall 7 and adjacent, in use, to the body of the door. Together with the rest of lever 3, walls 7 and 8 define an elongated cavity 9 communicating with the outside through two facing end openings 11 and 12. Opening 11 extends through end portion 6; opening 12 comes out inside a further cavity 13 formed in portion 4; and cavity 13 is closed partly by a cover 14 to define a chamber 15, and a conduit or passage 16 connecting chamber 15 to the outside.

[0015] A known detecting device 18 is housed radially loosely inside elongated cavity 9, and, in the particular example described, comprises a hollow outer casing 19 formed in one piece or by two connected half-shells, and an antenna or sensor 20 locked inside casing 19 and connected to wiring 21. Wiring 21 comes out of an end portion 23, adjacent to chamber 15, of casing 19, and extends outside through chamber 15 and passage 16 (Figure 1).

[0016] As shown in Figure 1 and particularly in Figure 2, end portion 23 of casing 19 is connected to intermediate portion 5 by an anchoring device 24 comprising an annular, conveniently elastic body 25 partly surrounding end portion 23 and which is forced inside cavity 9 to form a hinge enabling casing 19 to rotate to and from wall 7.

[0017] As shown in Figure 1, casing 19 is pushed against surface 7a of wall 7 by an elastic device 28 interposed between wall 8 and an end portion 26, opposite portion 23, of casing 19.

[0018] In the example described and shown in particular in Figures 1 and 3, device 28 comprises a supporting plate 29 resting on a portion of wall 8 adjacent to end portion 6 and end opening 11; and an elastically deformed lever 30, which is integral with plate 29, forms an acute angle A with plate 29, and terminates with a fastening portion 31 resting against an inner surface of portion 26 facing structure 2. Portion 31 has two adj-

cent holes 32, each engaged by a respective pin 33 integral with casing 19 and projecting from casing 19 parallel to the other pin 33. The portion of plate 29 opposite the portion integral with lever 30 is connected integrally to a cover 35 for closing end opening 11. In the particular example described, cover 35, supporting plate 29, and lever 30 form part of a single body 36 formed in one piece and connected releasably to portion 6 by a removable retaining pin 37.

[0019] In the Figure 4 variation, plate 29 is separate from cover 35; lever 30 is connected directly and integrally to casing 19; and elastic device 28 and casing 19 - or at least part of casing 19, if this comprises a number of parts - preferably form part of a single body 38 formed in one piece.

[0020] In actual use, annular body 25 provides for easily hinging one end of detecting device 18 and allowing the rest of device 18 to oscillate, inside cavity 9, to and from wall 7. And, in parallel, elastic device 28 forces portion 26 of casing 19 elastically against wall 7, so that the efficiency of detecting device 18 is in no way impaired by any external force transmitted to intermediate grip portion 5 by the user, or simply by the door being closed sharply, and such as to deform intermediate portion 5. In fact, when such external force is applied, device 18 is free to move, inside cavity 9, with respect to portion 5, upon the external force exceeding the elastic load imparted by device 28. In handle 1 described, elastic device 28 therefore makes detecting device 18 functionally unaffected by any deformation of intermediate portion 5, which may therefore be made of any, even flexible or easily deformable material.

[0021] In the absence of external force, device 18 is maintained by elastic device 28 in a stable condition, thus preventing any relative movement resulting in vibration or undesired acoustic emissions.

[0022] Forming elastic device 28 in one piece with cover 36 closing end opening 11 of insertion of detecting device 18 reduces the number of component parts, makes assembly faster, and improves the stability of the handle, by the component parts being interconnected so that each maintains its original position.

[0023] Cavity 13 and the particular cover 14, on the one hand, permit direct access to detecting device 18 to connect device 18 electrically to wiring 21, if necessary, once detecting device 18 is inserted inside intermediate portion 5 of lever 3, and, on the other, define the wiring conduit while greatly simplifying formation of the lever and assembly of the handle.

[0024] Clearly, changes may be made to handle 1 as described herein without, however, departing from the scope of the present invention. In particular, a different elastic forcing device may be provided and located in a different position from the one shown by way of example.

[0025] End portion 23 of device 18 may be connected differently to lever 3, even by means of a further elastic retaining device identical with or differing from the one

described.

[0026] Moreover, detecting device 18 may have no outer casing 19, and elastic device 28 and the anchoring device may act directly on the sensor or detecting antenna 20.

Claims

1. A handle (1) for a vehicle door, the handle (1) comprising fastening means (2), which are connected integrally to said door; a grip member (5), which is fitted to said fastening means (2), is gripped by a user, and defines an inner cavity (9); and detecting means (18) housed loosely inside said cavity (9); and being characterized by also comprising elastic forcing means (28) for keeping said detecting means (18) in contact with a seating surface (7a) in said cavity (9).
2. A handle as claimed in Claim 1, characterized in that said elastic forcing means (28) act on a surface of said detecting means (18) facing said fastening means (2), to push the detecting means (18) towards an outer front wall (7) of the grip member (5).
3. A handle as claimed in Claim 1 or 2, characterized by also comprising connecting means (24) for connecting a first portion (23) of said detecting means (18) to said grip member (5) in oscillating manner; said elastic forcing means (28) acting on a second portion (26), separate from said first portion (23), of said detecting means (18).
4. A handle as claimed in Claim 3, characterized in that said first (23) and said second (26) portion are end portions of said detecting means (18).
5. A handle as claimed in Claim 3 or 4, characterized in that said connecting means (24) comprise a connecting member (25) force-fitted inside said cavity (9).
6. A handle as claimed in any one of the foregoing Claims, characterized in that said cavity (9) has an insertion opening (11) for insertion of said detecting means (18); and in that said elastic forcing means (28) are located close to said insertion opening (11).
7. A handle as claimed in Claim 6, characterized by comprising closing means (35) for closing said insertion opening (11); said elastic forcing means (28) being carried by said closing means (35).
8. A handle as claimed in Claim 7, characterized in that said closing means comprise a closing member (35); said elastic forcing means (28) and said

closing member (35) forming part of a one-piece body (36).

9. A handle as claimed in Claim 7 or 8, characterized by comprising releasable further connecting means (32, 33) interposed between said elastic forcing means (28) and said detecting means (18). 5
10. A handle as claimed in Claim 9, characterized in that said further connecting means comprise at least one retaining seat (32) carried by said elastic forcing means (28) or said detecting means (18); and at least one pin (33) carried by the other of said elastic forcing means (28) or said detecting means (18) and engaging said seat (32). 10 15
11. A handle as claimed in one of Claims 8 to 10, characterized by comprising releasable fastening means (37) for connecting said one-piece body (36) releasably to said grip member (5). 20
12. A handle as claimed in any one of the foregoing Claims, characterized in that said elastic forcing means (28) comprise at least one elastically deformed push lever (30). 25
13. A handle as claimed in one of Claims 1 to 6, characterized in that said detecting means (18) comprise a detecting member (20), and an outer casing (19) housing said detecting member (20); said elastic forcing means (28) acting on said outer casing (19). 30
14. A handle as claimed in Claim 13, characterized in that said elastic forcing means (28) are carried by said outer casing (19). 35
15. A handle as claimed in Claim 14, characterized in that said elastic forcing means (28) comprise at least one elastically deformed lever (30) integral with said outer casing (19). 40
16. A handle as claimed in any one of the foregoing Claims, characterized by comprising a connecting opening (12, 13) connecting the cavity (9) with the outside; said detecting means (18) comprising wiring (21) extending through said connecting opening (12, 13); and plugging means (14) being provided to partly close said connecting opening (12, 13). 45 50
17. A handle as claimed in Claim 16, characterized in that said plugging means (14) are fitted releasably, and partly define a channel (16) for the passage of said wiring (21). 55

FIG. 1

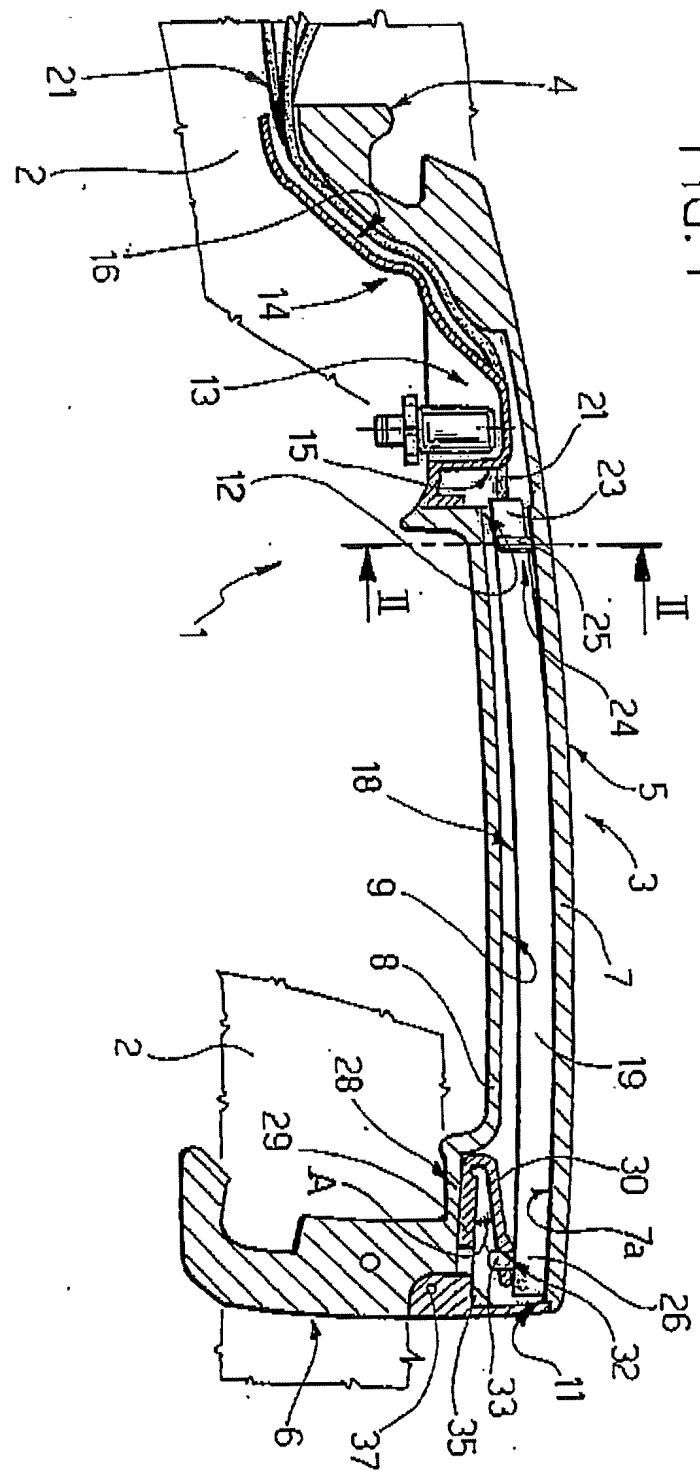


FIG. 2

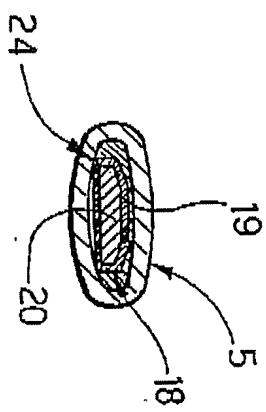


FIG. 3

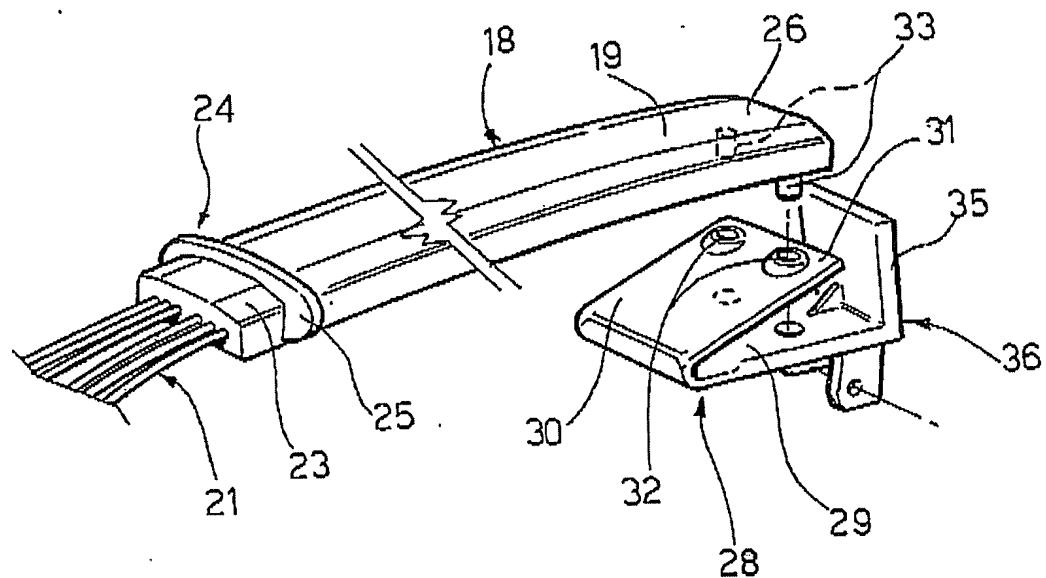
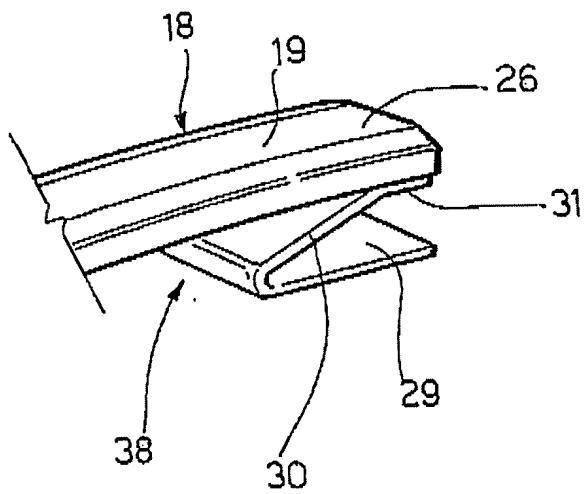


FIG. 4





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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0539

DOCUMENTS CONSIDERED TO BE RELEVANT		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages		
X	EP 1 035 276 A (VALEO SICUREZZA ABITACOLO SPA) 13 September 2000 (2000-09-13) * the whole document *	1,2,6, 16,17 3-5,7-15	E05B65/20
A	EP 1 006 028 A (TOYOTA JIDOSHA KK) 7 June 2000 (2000-06-07) * column 6, line 7 - line 27 *	1	
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	29 January 2002	Van Beurden, J	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document used for other reasons A : member of the same patent family, corresponding document O : non-written disclosure P : intermediate document	
EPO FORM 1602 02 02 (P0001)			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 83 0539

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
 The members are as contained in the European Patent Office EDP file on
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29-01-2002

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 For more details about this annex : see Official Journal of the European Patent Office, No. 12/82